

7TH INTERNATIONAL CONFERENCE ON HAND-ARM VIBRATION: AN OVERVIEW

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Since 23 years problems of occupational hand-arm vibration have been presented and discussed at seven international conferences. The seventh conference in this beautiful "Golden Town" Prague gave the possibility to meet those interested in the big field of hand-arm vibration from the medical as well as from the technical point of view, from aspects of scientific research as well as from aspects of practical application.

As Prof. Griffin during the last conference at Bonn 1992 in his excellent overview has shown there has been a continual increase in the number of papers presented at the conferences. And again we had this week - similar to the 6th conference - about 100 presentations. With nearly 60 oral contributions and 40 poster contributions presented from 46 different countries a new stage of knowledge could be shown and discussed.

For many studies reported on it can be seen that the authors belonged to different laboratories. This is a clear indication that there is increasing collaboration between different laboratories and different countries. This tendency undoubtedly will increase the progress of investigations in the future, too.

International Conferences on Hand-Arm Vibration have always concerned medical as well as technical problems of this kind of environment at many working places. This means that in order to solve problems in this area we need contributions from the medical sciences as well as from engineering sciences. But this demands also understanding from each side and activities for interdisciplinary cooperation.

We should keep in mind that the main aim of the research in this area is the health protection of vibration-exposed operators around the world against different kinds of hazard. This involves at least four main questions to be investigated:

- What are the harmful effects of hand-transmitted effects?
- Which diagnostic methods should be standardized to prove such effects?
- Which effective measures of prevention are available?
- How can medical and engineering knowledge be disseminated for practical application?

Concerning these questions the organizers have arranged for all presentations to this conference to make systematic contribution in the different sessions.

In the medical session it could be observed from the number of papers that peripheral circulation studies - despite research in this field for more than 30 years - still play a dominant role. There were some contributions on aetiology and pathogenesis of the VWF, on age-depending peripheral disturbances and on circulation disorders in the feet. Some papers pointed to the fact that the vibration-induced white finger disease does not seem to be reversible in many cases. But it is still not clear which of the different influencing factors are responsible and what the prognosis may be in individual cases.

Concerning the diagnostic methods for more general application, to my opinion, it may not be appropriate to develop

expensive methods of high scientific level, but to introduce standardized tests easy to handle and suitable for practical use in occupational medicine. It may be a positive step that the International Standard Organization ISO starts a project for standardization of the cold provocation test.

The many papers reporting on the vibrotactile perception threshold may be an indication that this method as a method of peripheral nervous function disturbances principally is able to satisfy the demands for application not only in laboratories but also in occupational health services. But up to now due to many influences from different measuring equipment and methods the results published mostly are not comparable. Standardization, therefore, urgently is needed. It is further interesting that the carpal tunnel syndrome CTS although not included in the vibration syndrome seems to be observed often in groups of vibration-exposed workers, too. In contrast there were only a few papers reporting bone and joint disorders found under low-frequency vibration exposure with high coupling forces of the hands.

Turning to technical and ergonomic aspects some presentations concerned the questions of increasing coupling forces (grip and push) for operating the tools. As we know coupling forces modify the results of vibration measurements in testing tools as well as have increasing effects on the hand-arm system. Proposals for standardizing the assessment of coupling forces have been presented.

In this connection there were also some papers on the energy transfer from the vibrating handle to the hand-arm system and again conceptions of mathematical and mechanical models of the human hand-arm system.

Only a few presentations contributed to vibration reduction techniques for specific tools. It also could be seen that still there are activities to improve the effects of anti-vibration gloves. Although the positive effect of AV-chain saws in epidemiological studies again could be proved, unfortunately the preventing effect of grip heating system for chain saws does not seem to be studied quantitatively up to now.

Concerning the influence of the climate an epidemiological study could prove that in a tropical rain area forestry workers did not suffer from VWF. But the authors could not deny subclinical dysfunctions of the peripheral circulation.

The dose-effect relationship has been tested in several studies. As known the Annex A of ISO 5349 is based on specific occupational exposures. So some papers showed in tendency that the prevalence of VWF for some groups of workers may be overestimated or underestimated by the ISO-dose-response calculation. Thus, it needs to be revised or made specific for individual tool types. In addition it would be useful to give some information in this Standard on the risk of bone and joint damages due to hand-arm vibration.

In conclusion during the 1995 International Conference on Hand-Arm Vibration a great variety of new information could be presented and discussed. This included both the